

In the Claims

Please amend the claims as follows:

1. (Canceled herein)
2. (Canceled herein)
3. (Canceled herein)
4. (Canceled herein)
5. (Currently amended) ~~The actuator assembly of claim 3,~~  
~~further comprising~~ An actuator assembly comprising:
  - a. an actuator support;
  - b. a fixed comb connected to the actuator support and  
having a plurality of fixed teeth extending in a first  
direction;
  - c. a member frame flexibly connected to the actuator  
support and having a first fulcrum axis;
  - d. a movable comb connected to the member frame and having  
a plurality of movable teeth extending in the first  
direction, wherein the fixed and movable teeth are  
arranged interdigitally from a perspective  
perpendicular to the first direction and the first  
fulcrum axis; and
  - e. an actuated member connected to the member frame and  
movable with respect to the member frame along a second  
fulcrum axis;
  - f. a frame comb rigidly connected to the member frame and  
having a plurality of frame-comb teeth extending in a  
second direction different from the first direction;

- g. a member comb rigidly connected to the member and having a plurality of member teeth extending in the second direction, wherein the frame-comb teeth and the member teeth are arranged interdigitally from the perspective perpendicular to the first direction and the first fulcrum axis; and
  - h. a hinge connecting the member frame to the actuator support, wherein the hinge includes a first portion electrically connected to the frame comb and a second portion electrically connected to the member teeth, and wherein the first portion is electrically insulated from the second portion.
- 6. (Canceled herein)
- 7. (Canceled herein)
- 8. (Currently amended) The actuator support of claim [[1]] 5, further comprising:
  - a. a second fixed comb rigidly connected to the actuator support and having a second plurality of fixed teeth extending in the first direction; and
  - b. a second movable comb rigidly connected to the member frame and having a second plurality of movable teeth extending in the first direction; wherein the second plurality of fixed teeth and the second plurality of movable teeth are arranged interdigitally from the perspective perpendicular to the first direction and the first fulcrum axis.

AO-001

9. (Original) The actuator assembly of claim 8, further comprising:
- a. a second frame comb rigidly connected to the member frame and having a second plurality of frame-comb teeth extending in the second direction; and
  - b. a second member comb rigidly connected to the member and having a second plurality of member teeth extending in the second direction;
  - c. wherein the second plurality of frame-comb teeth and the second plurality of member teeth are arranged interdigitally from the perspective perpendicular to the first direction and the first fulcrum axis.
10. (Canceled herein)
11. (Canceled herein)
12. (Amended herein) ~~The actuator assembly of claim 10,~~ An actuator assembly disposed on an actuator support, the actuator assembly comprising:
- a. a fixed comb connected to the actuator support and having a plurality of fixed teeth extending in a first direction;
  - b. a member frame flexibly connected to the actuator support and having a first fulcrum axis;
  - c. a movable comb connected to the member frame and having a plurality of movable teeth extending in the first direction, wherein the fixed and movable teeth are arranged interdigitally from a perspective perpendicular to the first direction and the first fulcrum axis; and

- d. an actuated member connected to the member frame and movable with respect to the member frame along a second fulcrum axis;
  - e. wherein the actuated member comprises a mirror; and
  - f. wherein the actuator assembly occupies a first area in a plane defined by the first fulcrum axis and the second fulcrum axis, and wherein the mirror surface occupies a second area at least one fourth the area of the first area.
- 13. (Currently amended) The actuator assembly of claim ~~[[1]]~~ 12, wherein the fixed comb comprises a semiconductor.
- 14. (Currently amended) ~~The actuator assembly of claim 1,~~  
further comprising An actuator assembly comprising:
  - a. an actuator support;
  - b. a fixed comb connected to the actuator support and having a plurality of fixed teeth extending in a first direction;
  - c. a member frame formed in a conductive layer and flexibly connected to the actuator support, the member frame having a first fulcrum axis;
  - d. a movable comb formed in the conductive layer and connected to the member frame, the movable comb having a plurality of movable teeth extending in the first direction, wherein the fixed and movable teeth are arranged interdigitally from a perspective perpendicular to the first direction and the first fulcrum axis;

- e. an actuated member connected to the member frame and movable with respect to the member frame along a second fulcrum axis; and
  - f. a hinge formed in the conductive layer and connecting the member frame to the actuator support, wherein the hinge is thinner than the ~~fixed~~ movable comb in a second direction perpendicular to the first and second axes.
15. (Currently amended) ~~The actuator assembly of claim 14,~~ An actuator assembly comprising:
- a. an actuator support;
  - b. a fixed comb connected to the actuator support and having a plurality of fixed teeth extending in a first direction;
  - c. a member frame flexibly connected to the actuator support and having a first fulcrum axis;
  - d. a movable comb connected to the member frame and having a plurality of movable teeth extending in the first direction, wherein the fixed and movable teeth are arranged interdigitally from a perspective perpendicular to the first direction and the first fulcrum axis;
  - e. an actuated member connected to the member frame and movable with respect to the member frame along a second fulcrum axis; and
  - f. a hinge connecting the member frame to the actuator support, wherein the hinge is thinner than the fixed comb in a second direction perpendicular to the first and second axes;

- g. wherein the hinge comprises two electrically conductive portions separated by an electrically insulating portion.
16. (Original) The actuator assembly of claim 14, wherein the hinge is serpentine.
17. (Currently amended) ~~The actuator of claim 1,~~ An actuator assembly comprising:
- a. an actuator support;
  - b. a fixed comb connected to the actuator support and having a plurality of fixed teeth extending in a first direction;
  - c. a member frame flexibly connected to the actuator support and having a first fulcrum axis;
  - d. a movable comb connected to the member frame and having a plurality of movable teeth extending in the first direction, wherein the fixed and movable teeth are arranged interdigitally from a perspective perpendicular to the first direction and the first fulcrum axis; and
  - e. an actuated member connected to the member frame and movable with respect to the member frame along a second fulcrum axis;
  - f. wherein the fixed teeth are of varying length.
18. (Currently amended) ~~The actuator of claim 1,~~ An actuator assembly comprising:
- a. an actuator support;

- b. a fixed comb connected to the actuator support and having a plurality of fixed teeth extending in a first direction;
  - c. a member frame flexibly connected to the actuator support and having a first fulcrum axis;
  - d. a movable comb connected to the member frame and having a plurality of movable teeth extending in the first direction, wherein the fixed and movable teeth are arranged interdigitally from a perspective perpendicular to the first direction and the first fulcrum axis; and
  - e. an actuated member connected to the member frame and movable with respect to the member frame along a second fulcrum axis;
  - f. wherein the movable teeth are of varying length.
19. (Currently amended) The actuator assembly of claim [[1]] 18, wherein the first fulcrum axis bisects the actuated member.
20. (Original) The actuator assembly of claim 19, wherein the second fulcrum axis bisects the actuated member.
21. (Currently amended) The actuator assembly of claim [[1]] 18, further comprising a torsional hinge connected between the actuator support and the fixed comb.
22. (Currently amended) The actuator assembly of claim [[1]] 18, further comprising an integrated circuit bonded to the actuator support and adapted to supply control voltages to at least one of the fixed and movable combs.

23. (Currently amended) An actuator assembly comprising:
- a. an actuator support;
  - b. a first comb means connected to the actuator support;
  - c. an actuated member flexibly connected to the actuator support;
  - d. a second comb means connected to the actuated member and adapted to move relative to the first comb means to position the actuated member;
  - e. wherein the actuated member rotates in a first dimension along a first fulcrum axis with respect to the actuator support; and
  - f. wherein the actuated member rotates in a second dimension along a second fulcrum axis with respect to the actuator support;
  - g. wherein the second comb means includes a plurality of teeth that move with respect to the first comb means, and wherein the teeth are of varying length.
24. (Original) The actuator assembly of claim 23, wherein the actuated member is adapted to move in a third dimension with respect to the actuator support.
25. (Original) The assembly of claim 23, further comprising a mirror disposed on the actuated member.
26. (Original) An actuator comprising:
- a. an actuator support;
  - b. a first set of teeth connected to the actuator support and extending in parallel;
  - c. a second set of teeth connected to the actuator support and extending in parallel;



- d. an actuated member connected to the actuator support;
  - e. a third set of teeth connected to the actuated member, wherein the teeth of the third set of teeth extend in parallel with the teeth of the first set of teeth, and wherein the first and third sets of teeth are arranged interdigitally from at least one perspective;
  - f. a fourth set of teeth connected to the actuated member, wherein the teeth of the fourth set of teeth extend in parallel with the teeth of the second set of teeth, wherein the second and fourth sets of teeth are arranged interdigitally from the at least one perspective, and wherein the teeth of the first and second sets are not parallel.
27. (Original) The actuator of claim 26, wherein applying a first voltage difference between the first set of teeth and the third set of teeth moves the actuated member along a first rotational axis relative to the actuator support, and wherein applying a second voltage difference between the second set of teeth and the fourth set of teeth moves the actuated member along a second rotational axis relative to the actuator support.
28. (Original) The actuator of claim 27, wherein the first rotational axis is perpendicular to the second rotational axis.
29. (Original) The actuator of claim 27, wherein the first and third sets of teeth are curved.
30. (Canceled herein)

31. (Canceled herein)

32. (Canceled herein)

33. (Currently amended) ~~The actuator of claim 30,~~ An actuator comprising:  
a. an actuator support;  
b. an actuated member movably connected to the actuator support;  
c. a first set of interdigitated combs adapted to pivot the actuated member relative to the actuator support along a first fulcrum axis in response to a first applied voltage; and  
d. a second set of interdigitated combs adapted to move the actuated member relative to the actuator support along a second fulcrum axis in response to a second applied voltage;  
e. wherein the actuated member is adapted to simultaneously move translationally and rotationally relative to the actuator support.

34. (Original) The actuator of claim 33, wherein the actuated member is adapted to simultaneously move relative to the actuator support translationally in two directions and rotationally.

35. (Canceled herein).

36. (Canceled herein).

AO-001

37. (Canceled herein).

38. (Canceled herein).

39. (Canceled herein).

40. (Canceled herein).

41. (Canceled herein).

Claims 42-75 were cancelled by preliminary amendment dated December 20, 2001.

76. (New) The actuator assembly of claim 12, wherein the second area is at least 20% of the first area.